REMARKS

This amendment is in response to the Examiner's Office Action dated 3/12/2004. Applicant is appreciative for the recognized allowable subject matter. This amendment should obviate outstanding issues and make the remaining claims allowable. As a result of the present amendment, claims 1-7, 9-11, 13-20, 22-31, 33-35, 37-44, 46-55, 57-59, 61-68, and 70-73 are pending and active in the present case. The present amendment cancels claim 69 and non-elected claims 74-79, 81-89, 91-96, 98-106, 108-113, 115-123, and 125-133. Reconsideration of this application is respectfully requested in view of the foregoing amendment and the remarks that follow.

STATUS OF CLAIMS

Claims 1-7, 9-11, 13-20, 33-35, 37-44, 46-55, 57-59, 61-79, 81-89, 91-96, 98-106, 108-113, 115-123, and 125-133 are pending.

Claims 8, 12, 21, 32, 36, 45, 56, 60, 80, 90, 97, 107, 114, and 124 were cancelled in a preliminary amendment.

Claims 1, 9, 10, 22-25, 33, 34, 46-49, 57, 58, and 70-73 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grossman et al. (USP 5,307,450).

Claims 11, 13, 14, 20, 35, 37, 38, 44, 59, 61, 62, 68, and 69 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grossman et al. as applied to claims 1, 25, and 49, and further in view of Fowler (USP 6,108,011).

Claims 15, 39, and 63 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grossman et al. as applied to claims 1, 25, and 49, further in view of Fowler as applied to calims 14, 38, and 62, and further in view of Horikawa et al. (USP 6,326,968 B1).

Claims 2-7, 16-19, 26-31, 40-43, 50-55, and 64-67 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

35 USC § 103 Rejections Based on Grossman

Claims 1, 9, 10, 22-25, 33, 34, 46-49, 57, 58, and 70-73 stand rejected under 35 U.S.C. § 103 as unpatentable over Grossman et al. (U.S. Patent No. 5,307,450, hereinafter "Grossman"). The Examiner asserts that Grossman discloses claim 25. In particular, the Examiner asserts that Grossman discloses an:

a. "interpolated line computational step" at column 5, lines 52-53;

b.. "determining an interpolated line which is a line that interpolates a space between two vertices from an interpolation vector" at column 5, lines 57-58; and

c. "an interpolation vector used for determining a line that interpolates a space between a given vertex and another vertex ... and from coordinates of said vertices" [No reference given]; and

d. "an interpolated point computation step of determining, as vertices of said sub-unit graphic forms, interpolated points which are points on said interpolated line." at column 5, lines 49-58 and column 11, line 52 through column 12, line 16.

Even though the Examiner does not appear to rely on any additional reference in forming the rejection under 35 U.S.C. §103 or assert that there is some feature of claim 25 that is not identically disclosed by Grossman, Applicants response below relates to failure to establish a prima facie case of obviousness rather than the principles of anticipation.

In general, claim 25 recites an interpolated line computation step and an interpolated point computation step. Applicants respectfully disagree with the Examiner's interpretation of

Grossman and urge that Grossman does not, even generally, disclose an interpolated line computational step. The section of Grossman referred to by the Examiner in stating the rejection discusses interpolating display parameters between two vertices. Such parameters can include texture information, Z information, and other parameters. According to Grossman, vertex data is reduced to pixel data by assigning each pixel a coordinate and parameter values. This process is more fully described at columns 11 and 12 of Grossman which disclose that an object is broken into primitives (some of which can be further decomposed) and then sliced into components using predetermined Z planes. When Grossman discusses interpolation (at column 12, lines 1-7) it is clear that what is described is interpolating texture parameters, or similar parameters, onto the individual points of a component. Accordingly, Grossman does not disclose computing an interpolated line between two vertices as recited in claim 25.

Additionally, claim 25 recites that the interpolated line computation is based on an interpolation vector and vertex coordinates. To the extent that Grossman discusses the use of interpolation at all, Grossman does not disclose or suggest an interpolation vector nor specifically using such a vector to calculate any interpolated values such as an interpolated line.

The step of computing interpolated points on an interpolated line pre-supposes an interpolated line. Because Grossman does not disclose an interpolated line, nor suggest anything resembling an interpolated line as meant within the claims, Grossman does not disclose or suggest the step of computing interpolated points which are points on said interpolated line. While Grossman discloses interpolating display parameters for points between vertices, Grossman does not disclose or suggest computing the interpolated points, themselves, as recited in claim 25.

One requirement for establishing a prima facie case of obviousness is that all features recited in the claim must be disclosed or suggested by the one or more references on which the

rejection is based. Applicants urge that Grossman does not disclose or suggest all the limitations recited in claim 25 and therefore Grossman does not provide the factual basis for establishing a prima facie case of obviousness. Accordingly, reconsideration and withdrawal of the rejection of claim 25 are respectfully requested.

The Examiner asserts that claims 1 and 49 are, respectively, a device and medium for performing the method of claim 25. Accordingly, these two claims stand rejected on the same basis as claim 25. For at least the reasons provided above with respect to claim 25, reconsideration and withdrawal of the rejection of claims 1 and 49 are requested as well. Because the claims that depend from claims 1, 25 and 49 incorporate all the limitations of their parent claim, Grossman does not disclose or suggest every feature in these dependent claims. Accordingly, Grossman, either singly or in combination with additional references, does not disclose or suggest all the limitations recited in the dependent claims. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103 of all claims which depend from claims 1, 25 and 49.

The Examiner asserts that Grossman discloses claim 33 and the corresponding device of claim 9 and the corresponding medium of claim 57. Grossman discloses (at column 3, lines 60-62) that an object description includes "surface normal vectors" used for lighting calculations. The present application also recognizes that normal vectors may be used for shading (see page 12, lines 15-18). However, claim 33 recites that the interpolation vectors are normal-direction vectors and referring back to claim 25, the interpolation vector is used to compute an interpolated line. Grossman does not disclose a normal-direction vector that is used to compute an interpolated line and, therefore, does not disclose or suggest the features of claim 33. Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of

claims 9, 33, and 57 are respectfully requested.

The Examiner asserts that Grossman discloses claim 34 and the corresponding device of claim 10 and the corresponding medium of claim 58. The disclosure of Grossman is silent regarding the features of claim 34. In particular, claim 34 recites that the interpolation vectors include in addition to the normal vectors, vectors which define the directions of the interpolated lines. Grossman simply does not disclose nor suggest vectors in addition to normal vectors. Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claims 10, 24, and 58 are respectfully requested.

The Examiner asserts that Grossman discloses claim 46 and the corresponding device of claim 22 and the corresponding medium of claim 70. Because these claims depend from claims 1, 25 and 49 , respectively, for at least the reasons provided above with respect to those base claims Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claims 22, 46, and 70 are respectfully requested.

The Examiner asserts that Grossman discloses claim 47 and the corresponding device of claim 23 and the corresponding medium of claim 71. Because these claims depend from claims 1, 25 and 49 , respectively, for at least the reasons provided above with respect to those base claims Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claims 22, 46, and 70 are respectfully requested.

The Examiner asserts that Grossman discloses claim 48 and the corresponding device of claim 24 and the corresponding medium of claim 72. Because these claims depend from claims 1, 25 and 49 , respectively, for at least the reasons provided above with respect to those base

claims Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claims 24, 48, and 72 are respectfully requested.

The Examiner asserts that Grossman discloses claim 73. This claim recites providing the interpolation vectors. Because Grossman does not compute interpolation vectors, use interpolation vectors, or store interpolation vectors, as meant within the claims, Grossman cannot and does not disclose or suggest providing interpolation vectors as recited in claim 73. Accordingly, Applicants urge that Grossman does not provide the factual basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claim 73 are respectfully requested.

35 U.S.C. § 103 Rejections Based on Grossman in view of Fowler

Claims 11, 13, 14, 20, 35, 37, 38, 44, 59, 61, 62, 68, and 69 stand rejected under 35 U.S.C. § 103 as unpatentable over Grossman in view of Fowler (U.S. Patent No. 6,108,011, hereinafter "Fowler").

With respect to claim 35, the Examiner admits that Grossman does not disclose "said interpolation vectors at the vertices of said unit graphic forms are interpolated line direction vectors which define directions of said interpolated lines at said vertices." The Examiner asserts, however, that Fowler discloses such a limitation at column 5, lines 18-43 and column 6, lines 47-50. The Examiner concludes that one of ordinary skill would have been motivated to modify the system of Grossmann based on Fowler because "Key-frame interpolation is most often applied to sets of data that are singled valued, such as particular angle or rotation, or points in two- or three-dimensions. A more specific application, where the data posed and interpolated is a set of

two- or three- dimensional geometric models is commonly referred to as 'shape interpolation'".

Applicants respectfully disagree with the Examiner's interpretation of Fowler and the conclusion that one of ordinary skill would have been motivated to combine the teachings of Grossman and Fowler. Fowler relates to key-frame interpolation techniques used in computer animation and specifically to shape interpolation. Generally such techniques specify key frames, or key poses, of an object and then interpolate how that object would change appearance when changing from one key frame to the next. The interpolation that occurs in these techniques does not involve interpolating a line between two vertices of a static object but, instead, interpolating the position of each point of an object as it transitions from one key frame to another. In other words, the movement of each point to get from one pose to the next is what is being computed or calculated. The system of Fowler, therefore, does not involve interpolated lines between two vertices of an object. As a result, Fowler does not disclose or suggest interpolation vectors that are "interpolated line direction vectors which define directions of said interpolated lines," as recited in claim 35.

Applicants further urge that one of ordinary skill would not have been motivated to combine these two references. The shape interpolation of Fowler is applied individually to points of a geometrical model to generate computer animation sequences involving those points. The interpolation of Grossman involves interpolating display parameter values of pixels located between two different vertices. Applicants urge that there is no realistic reason why one of ordinary skill would be motivated to apply interpolation techniques involving the transition of a single point over time to a system that interpolates values between two different vertices that remain fixed in position.

Applicants urge that Grossman and Fowler, either singly or in combination, do not suggest or disclose every feature recited in claim 35. Additionally, Applicants urge that one of

ordinary skill would not have been realistically motivated to modify the system of Grossman based on the disclosure of Fowler. Accordingly, Applicants urge that Grossman and Fowler do not provide the factual or legal basis for establishing a prima facie case of obviousness and, therefore, reconsideration and withdrawal of the rejection of claim 35 are respectfully requested.

The Examiner asserts that claims 11 and 59, respectively, recite a device and medium for performing the method of claim 35 and, thus, are rejected on the same basis as claim 35. For at least the reasons provided above with respect to claim 35, reconsideration and withdrawal of the rejection of claims 11 and 59 are requested as well.

With respect to claims 13, 14, 20, 37, 38, 44, 61, 62, 68, and 69, Applicants further urge that one of ordinary skill would not have been motivated to combine Grossman and Fowler. The shape interpolation of Fowler is applied individually to points of a geometrical model to generate computer animation sequences involving those points. The interpolation of Grossman involves interpolating display parameter values of pixels located between two different vertices. Applicants urge that there is no realistic reason why one of ordinary skill would be motivated to apply interpolation techniques involving the transition of a single point over time to a system that interpolates values between two different vertices of a static object. Applicants urge, therefore, that one of ordinary skill would not have been realistically motivated to modify the system of Grossman based on the disclosure of Fowler. Accordingly, Applicants urge that Grossman and Fowler do not provide the requisite foundation for establishing a prima facie case of obviousness under 35 U.S.C. §103. Thus, reconsideration and withdrawal of the rejection of claims 13, 14, 20, 37, 38, 44, 61, 62, 68, and 69 are respectfully requested.

35 U.S.C. § 103 Rejections Based on Grossman in view of Fowler and further in view of Horikawa

Claims 15, 39 and 63 stand rejected under 35 U.S.C. §103 as unpatentable over Grossman in view of Fowler further in view of Horikawa et al. (U.S. Patent No. 6,326,968, hereinafter "Horikawa"). The Examiner admits that the combination of Grossman and Fowler does not disclose "wherein when the ratio of values corresponding to a distance from said interpolated point between one vertex and another vertex ...is denoted by t:1-t, said interpolation vector computation step determines as the interpolation vector at said interpolated point a result corresponding to the sum ..." However, the Examiner asserts that Horikawa discloses this particular computation at column 5, lines 21-34 and column 9, lines 25-33. The Examiner concludes that one would be motivated to combine Horikawa with Grossman and Fowler to "enable approximation of a geometric model used for CG in a state that normal vectors are appended, and which enable prevention of distortion of the normal vectors in approximation results."

Horikawa relates to removing edges from a geometrical model to simplify the model. (See column 3, lines 36-40, and lines 44-46). As such, Horikawa, in contrast to the present invention, focuses on ways to remove information between vertices instead of providing interpolated data between vertices to improve the display of a graphical object. The portions of Horikawa relied on by the Examiner involve a discussion of edge removal in which a vertex is also removed. In such an instance, Horikawa teaches that the position of the remaining vertex should be relocated to improve the approximated model. Horikawa interpolates the new position for the vertex in between two other vertices. Horikawa, however, does not disclose or suggest computing an interpolated line between two vertices as recited in the claims. Horikawa also discloses that a normal vector for the remaining vertex should be changed as well. (see column

6, lines 7-19).

While Horikawa discloses an awareness of the ratio t:t-1 and the vector summation formula recited in claim 39, Horikawa does not disclose or suggest the limitations of claim 39 because claim 39 does not merely recite the existence of these formulas and ratio but, instead, recites a specific use for this information. Claim 39 recites that an interpolation vector is determined by summing different weighted vectors at each vertex. Horikawa does not disclose or suggest interpolation vectors. Accordingly, the combination of Grossman, Fowler and Horikawa also does not disclose or suggest such a limitation and, therefore, does not provide the requisite foundation for establishing a prima facie case of obviousness under 35 U.S.C. §103. Thus, reconsideration and withdrawal of the rejection of claim 39 are respectfully requested.

The Examiner asserts that claims 15 and 63, respectively, recite a device and medium for performing the method of claim 39 and, thus, are rejected on the same basis as claim 39. For at least the reasons provided above with respect to claim 39, reconsideration and withdrawal of the rejection of claims 15 and 63 are requested as well.

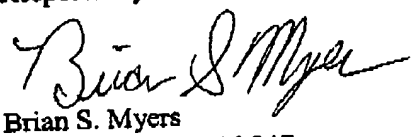
SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of applicant's presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

A petition for extension of time has been filed with this amendment.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact applicant's representative at the below number.

Respectfully submitted,



Brian S. Myers
Registration No. 46,947

Katten Muchin Zavis Rosenman
575 Madison Avenue
New York, NY 10022-2585
(212) 940-8703
September 10, 2004